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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Klaus Biester

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EXAMINER

ROST, ANDREW J

ART UNIT

PAPER NUMBER

3753

DATE MAILED: 11/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/525,926

Applicant(s)

BIESTER, KLAUS

Examiner

Andrew J. Rost

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3753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 9/18/06.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is in response to the Amendment filed on 9/18/2006. No claims were canceled. Claims 1-15 and 17-23 have been amended. Claims 24-28 have been added. Presently, claims 1-28 are pending.

Specification

2. The disclosure contains the following informalities:

Paragraph [0007] states "this object is solved by the characteristics of claim 1". The use of referencing of the claims in the specification is improper.

Appropriate correction is required.

3. The amendment filed 9/18/2006 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: "a transmission ratio lower than 25 and greater than 1" in paragraph [0024] and "the double helical gear has a transmission ratio of between 25 and 1" in claim 12.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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5. Claim 12 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The transmission ratio being between 25 and 1 was not disclosed in the originally filed specification.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-7, 11, 13-15, 17-23 and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. (6,585,246) in view of Hormansdorfer et al. (6,227,082).

Regarding claims 1 and 28, McCormick et al. disclose a regulating device having a ball spindle drive (ball nut 22 rotates a screw 24) with the ball nut being rotated by motor (14) through a first gear (18) connected to a ball nut assembly and a second gear (16) connected on the end of the motor drive shaft (17). McCormick et al. do not disclose the gears being spur-wheel gears having helical teeth. However, Hormansdorfer et al. teach the use of double screw gears designed to be self-locking in order to prevent damage to the internal drive in the case of a machine crash.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to create the first and second gear of McCormick et al. as a double screw gear having self-locking characteristics as taught by Hormansdorfer et al. in order to prevent damage to the internal drive in the case of a machine crash.

In regards to claim 2, McCormick et al. disclose a ball nut (22) that is allowed to rotate but is constrained from axial movement and the ball nut rotates and linearly translates a screw (24) to move an actuator.

In regards to claim 3, McCormick et al. disclose a rotating screw and actuating element are arranged along a common axis (fig. 1).

In regards to claim 4, the modified McCormick et al. reference discloses the ball nut connected to a first gear (18) while the motor is connected a second gear (16).

In regards to claim 5, McCormick et al. disclose an electric motor (col. 2, lines 25-26).

In regards to claims 6 and 7, the modified McCormick et al. reference discloses an additional second gear (34) that connects to the first gear and is operated by a second motor (32).

In regards to claims 11 and 27, the modified McCormick reference discloses a helix angle of approximately 80° (Hormansdorfer et al., col. 6, lines 10-13).

In regards to claim 13, McCormick et al. disclose the housing to be of a module design with the housing being flange-mounted (attached at flange extending from lower portion of housing in Fig. 1).

In regards to claim 14, McCormick et al. disclose the housing having a first module (upper portion of housing containing motors 14,32 and ball nut 22) and a second module (lower portion of housing having screw 24 and stop collar 46).

In regards to claim 15, McCormick et al. disclose an intermediate cover (plate that gears 16,34 are set on) that provides single-ended support of the second gears.

In regards to claim 17, McCormick et al. disclose the first gear mounted on the opposite side of the ball nut from the actuating element (Fig. 1).

In regards to claim 18, McCormick et al. disclose an intermediate ring (ball nut hub 20) placed between the ball nut and the first gear.

In regards to claim 19, McCormick et al. disclose bearing (40) to support the ball nut and a retention ring (Fig. 1).

In regards to claim 20, McCormick et al. disclose the actuating element (element connected to the end of screw 24 opposite the ball nut) that is supported from rotating.

In regards to claim 21, McCormick et al. disclose the second motor (32) is wired in parallel to the first motor (14) and acts as a slave to provide additional torque (col. 2, lines 52-55).

In regards to claims 22, 25 and 26, the modified McCormick et al. reference discloses the second gear having differing amounts of teeth than the first gear producing a change in gear ratio. The modified McCormick et al. reference does not expressly disclose a ratio of the teeth of the first gear to the teeth of the second gear to be 1 to 10, 1 to 7 or 1 to 4. The prior art recognizes the gear ratio as a results-effective variable, i.e. a variable that achieves a recognized result. In the instant case, the ratio

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of the teeth of the first gear to the teeth of the second gear should be adjusted to obtain a desired output on the actuating element from the input of the electric motors. Since the prior art recognizes this as a results-effective variable, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have chosen the gear ratio to be 1 to 10, 1 to 7, or 1 to 4, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (MPEP 2144.05).

In regards to claim 23, McCormick et al. disclose the motors operating together and are coupled to each other through the second and first gears.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. in view of Hormansdorfer et al. and further in view of Waber (6,095,487).

McCormick et al. in view of Hormansdorfer et al. discloses an actuator having a motor operating a second gear that rotates a first gear that rotates a ball nut to turn a screw to operate the actuator. The modified McCormick et al. reference does not disclose the use having at least two motors arranged on each drive shaft. However, Waber teaches the placement of a second motor on a drive shaft to operate a drive shaft for the purpose of compensating for position errors in the drive units (col. 1, lines 18-21). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to place a second motor on the drive shafts of the modified

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McCormick et al. reference as taught by Waber in order to compensate for position errors in the drive units.

9. Claims 9-10 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. in view of Hormansdorfer et al. and further in view of Allen (5,722,304).

In regards to claims 9-10 and 24, the modified McCormick et al. reference discloses an actuator having a motor operating a second gear that rotates a first gear that rotates a ball nut to turn a screw to operate the actuator. The modified McCormick et al. reference does not disclose the use of a reduction gear. However, Allen teaches the use of an harmonic drive in a linear actuator because harmonic drives provide a high gear ratio, low backlash, high efficiency, long life and mounting simplicity (col. 3, lines 56-62). Therefore, it would have been obvious to provide the actuator of the modified McCormick et al. reference with the harmonic drive as taught by Allen in order to provide the actuator with a high gear ratio, low backlash, high efficiency and long life.

10. Claim 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. in view of Hormansdorfer et al. and further in view of Coppola et al. (5,743,348).

In regards to claim 12, the modified McCormick et al. reference discloses an actuator having a motor operating a second gear that rotates a first gear that rotates a ball nut to turn a screw to operate the actuator. The modified McCormick et al. reference

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does not expressly disclose a transmission ratio between 25 and 1. However, Coppola et al. teach a transmission ratio of approximately 11.46 so that when the motor outputs 12,000 rpm, the speed is reduced to the order of 1,050 rpm in order to slow the rotation of the output shaft for improved control over the electric motor output (col. 5, lines 35-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the actuator of the modified McCormick et al. reference with a transmission ratio of 11.46 as taught by Coppola et al. in order to provide improved control over the output shaft.

11. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. in view of Hormansdorfer et al. and further in view of Gilges et al. (5,370,011).

In regards to claim 16, the modified McCormick et al. reference discloses an actuator having a motor operating a second gear that rotates a first gear that rotates a ball nut to turn a screw to operate the actuator. The modified McCormick et al. reference does not disclose the placement of a position sensor in the housing. However, Gilges et al. teach the placement of a position sensor through an intermediate cover for the purpose of measuring the position of a control element and transmit a signal to the control system to adjust the position of the control element. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to place a sensor through an intermediate cover to measure the position of the rotating

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member of the modified McCormick et al. reference as taught by Gilges et al. in order to provide feedback and position control for the actuating element and rotating member.

Response to Arguments

12. Applicant's arguments with respect to claims 1-23 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew J. Rost whose telephone number is 571-272-

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2711. The examiner can normally be reached on 7:00 - 4:30 M-Th and 7:00 - 12:00 Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eric Keasel can be reached on 571-272-4929. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJR *AJR 11/16/06*



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